

Client's ref.: 92068

Our ref: 0548-10294US/final/王琮都(spin)/Steve

**What is claimed is:**

1        1. A method of forming an interlayer dielectric  
2 layer, comprising the steps of:

3        providing a substrate;

4        forming a dielectric layer containing boron and  
5            phosphorous overlying the substrate;

6        performing a plasma treatment on the dielectric layer  
7            containing boron and phosphorous;

8        In-situ formation of a capping layer overlying the  
9            dielectric layer containing boron and phosphorous  
10          to serve as the interlayer dielectric layer with  
11          the dielectric layer containing boron and  
12          phosphorous; and

13       performing a reflow process on the interlayer  
14          dielectric layer.

1        2. The method as claimed in claim 1, wherein the  
2 dielectric layer containing boron and phosphorous is a  
3 borophosphosilicate glass (BPSG) layer.

1        3. The method as claimed in claim 2, wherein the  
2 dielectric layer containing boron and phosphorous has a  
3 thickness of about 4000 to 10000Å.

1        4. The method as claimed in claim 1, wherein the  
2 plasma treatment is performed using an inert gas as a  
3 process gas.

1        5. The method as claimed in claim 4, wherein the  
2 inert gas comprises argon or nitrogen.

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1        6. The method as claimed in claim 1, wherein the  
2 plasma treatment is performed at 600 to 700°C.

1        7. The method as claimed in claim 1, wherein the  
2 plasma treatment is performed for 5 to 20sec.

1        8. The method as claimed in claim 1, wherein the  
2 capping layer is an undoped silicate glass (USG) layer.

1        9. The method as claimed in claim 8, wherein the  
2 capping layer has a thickness of about 120 to 140Å.

1        10. A method for preventing formation of etching  
2 defects in a contact, comprising the steps of:  
3        providing a substrate;  
4        forming a borophosphosilicate glass layer overlying the  
5        substrate;  
6        performing a plasma treatment on the  
7        borophosphosilicate glass layer;  
8        forming an in-situ undoped silicate glass layer  
9        overlying the borophosphosilicate glass layer to  
10        serve as an interlayer dielectric layer with the  
11        borophosphosilicate glass layer;  
12        performing a reflow process on the interlayer  
13        dielectric layer; and  
14        etching the interlayer dielectric layer to form at  
15        least one contact opening therein to expose the  
16        surface of the substrate.

1        11. The method as claimed in claim 10, further filling  
2 the contact opening with a conductive plug.

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1        12. The method as claimed in claim 10, wherein the  
2 borophosphosilicate glass layer has a thickness of about  
3 4000 to 10000Å.

1        13. The method as claimed in claim 10, wherein the  
2 plasma treatment is performed using argon as a process gas.

1        14. The method as claimed in claim 10, wherein the  
2 plasma treatment is performed using nitrogen as a process  
3 gas.

1        15. The method as claimed in claim 10, wherein the  
2 plasma treatment is performed at 600 to 700°C.

1        16. The method as claimed in claim 10, wherein the  
2 plasma treatment is performed for 5 to 20sec.

1        17. The method as claimed in claim 10, wherein the  
2 undoped silicate layer has a thickness of about 120 to 140Å.